

Science in the Public Square

Years ago, William F. Buckley famously quipped that he would rather be governed by the first 2,000 names in the Boston phone book than by the Harvard faculty. After the 2004 presidential election, we might say the same about many of America's leading scientists. We do not say this to denigrate the scientists or their work. For the most part, their achievements in the laboratory hold our deepest admiration. Their genius makes modern life and modern democracy possible. Their inventions create wealth, cure disease, and provide the material means for defending liberty against tyranny. Without scientific greatness, American greatness is unthinkable. And without scientific achievement, America would shine less brightly in the history of human civilizations.

But it is precisely the greatness of scientists in the experimental sphere that sometimes deforms their political judgment. In the laboratory and the lecture hall, research scientists grapple intimately with the deepest mysteries of nature: the evolution of species, the biological workings of mind and body, the molecular underpinnings of the material world. But because their *end* is so noble—objective knowledge of nature, often “useful for life”—scientists sometimes forget that it is also partial and dependent. Even a fully demystified nature offers no obvious guide for living a decent life. And the activity of demystifying nature requires many non-scientific institutions and supports—such as a productive economy, a stable polity, and a culture that rears the young to follow in their elders' footsteps. Precisely because the scientific method works so well in acquiring objective knowledge of the natural world, scientists often forget that it cannot supply the wisdom individuals need to live well in the human world, or settle the hard political questions that citizens face about the role of science in a democratic society.

Still, the belief in rule by expertise has often found a hearing on the political left. It certainly found a spokesman in Senator John Kerry, who tried to sell himself as the defender of scientific progress against “mere ideology.” Of course, this was all very silly. There is a great American consensus in favor of scientific progress. And there is a longstanding romance on the political right with the liberating powers of technological change—a romance largely unbroken from Ronald Reagan to Newt Gingrich to

George W. Bush. During the first four years of the Bush administration, the overall research and development budget increased by 44 percent and the National Institutes of Health budget increased by 42 percent. Like the Clinton administration, the Bush administration dramatically increased federal funding for cutting-edge nanotechnology research. It ramped up federal funding to fight AIDS, tuberculosis, and malaria—diseases that disproportionately affect those who have least benefited from modern progress. And the central reason conservatives oppose price controls for prescription drugs and large-scale government interventions in American healthcare is because they fear a great slowdown in biomedical progress.

What is clear is that there is no single party of progress in American life. Conservatives and liberals both believe in the virtues of modernity, often in identical ways. But they also offer competing visions of what progress is, where it leads, and what it requires. Conservatives want to send men to Mars, ban embryo research, develop new weapons systems, and build hydrogen cars. Liberals want to keep human beings on earth, fund embryo research, curb weapons spending, and build hydrogen cars. The two political camps sometimes disagree about the respective roles of government and the private sector in promoting scientific and technological progress. And they sometimes disagree more profoundly about what it means to *advance*, with very different conceptions of what should be “off limits” to scientific research and technological development. The machine in the garden distresses liberals; the pipette in the embryo distresses conservatives.

During this election season, the Bush administration was attacked *ad nauseum* for “politicizing science.” The attack was driven most powerfully by resentment against the Bush policy limiting federal funding for embryonic stem cell research—a policy that does not deny the unique value of embryonic stem cells, but believes that America should not make embryo destruction a national project. To call this “politicizing science” is surely true, but so is seeking public dollars for embryo research in the first place. The future of science, especially morally controversial science, is always rightly a democratic question—a question for citizens, not just scientists. Moreover, to promise medical miracles when the scientific facts do not quite measure up—as leading scientists shamelessly did in the California stem cell debate—politicizes science in the worst possible way.

On certain matters, of course, scientists deserve a privileged voice in the public square. Only they, for example, can tell us which areas of research are the most promising for curing Alzheimer’s, or estimate the ecological significance of global warming, or judge the feasibility of a

given missile defense system. Not all scientists will likely agree on these questions. And looking back, many scientific predictions have turned out to be false, sometimes even absurd. But in the end, only scientists can provide a reasonable estimate of what is possible, and making science policy without the best expertise is a fool's errand.

But such expertise is where the politics of science begins, not ends. While we should never doubt the scientific community's commitment to the ideal of objectivity, we also cannot ignore the fact that even the best scientists have their own narrow interests. Those who are personally invested in embryonic stem cells are likely to believe that their research is uniquely important, perhaps more important and more promising than it really is. And those who worry daily about ecological degradation for a living are likely to believe that addressing this problem is more urgent than addressing the nation's energy needs or the threat of nuclear proliferation. In a democracy like ours, the scientists who promise pending miracles or looming disasters often get the most funding and most attention. There is an institutional incentive to exaggerate, and a psychological incentive to see one's own narrow piece of reality as larger than it is. This does not mean that scientists do not believe what they say or that what they say is always distorted. We ignore their warnings at our own peril and their good tidings at our own loss. But we must also interpret the public pronouncements of scientists for what they are: the human voice of human experts, both fallible and partial.

As a society, we must make hard and often ambiguous choices about science, choices that scientific knowledge alone can never make for us. We must set priorities, weigh risks and benefits, and establish moral limits on experimentation. The principles of biology cannot tell us whether or not to develop artificial viruses, or destroy human embryos, or invest more money in stem cells or space travel. These are, in the end, questions of value and of prudence. Many of these decisions are rightly left to the marketplace—to the drama of supply and demand and trial and error. But most citizens do not believe that the amorality of the marketplace should settle everything. Rather, they believe that there is a public interest in directing the future of science—both funding basic and applied research and shaping the relationship between our scientific pursuits and our democratic ideals.

Discerning this public interest requires reflection and deliberation on three sets of questions: First, given the limited resources and competing ideals of American society, what human *priorities* should govern the scientific enterprise? Second, given that scientific research and technological

advance often require the exploitation of nature, what *ethical limits* should govern experimentation and development? And what limits in particular should govern experimentation with human subjects? Third, given that many scientific discoveries can be turned to multiple purposes, some good and some evil, how do we weigh the *risks and benefits* of disseminating certain types of knowledge or developing certain types of technologies?

Neither conservatives nor liberals have simple answers to these democratic questions. But as the nation prepares for a second Bush term, it might be useful to lay out a richer idea of technological progress—with all its burdens and blessings, choices and limits, greatness and tragedy. In doing so, we might offend some conservatives and surprise some liberals, but such is the danger and delight of thinking philosophically and politically about novel human powers. What we offer is a mode of thought, not a detailed program; a disposition, not an agenda. But hopefully it will do some limited good for those who must govern, and perhaps instruct those who falsely believe that science can replace politics.

1. Technology is often the way that scientific excellence reveals itself; it is the way inner genius becomes visible to ordinary men and women. The average citizen may never understand Einstein's physics, but he can understand the greatness of landing a man on the moon as well as the ingenious horror of the bombs at Hiroshima. Any sound science policy will promote scientific projects that inspire civic piety—projects that celebrate man's ingenuity, daring, and mastery of nature, and that promote America's exceptional spirit of achievement. These projects will not seek or promise to conquer man's problems—like suffering and disease—but to demonstrate man's nobility even in a world of endless problems and imperfections. Such projects will direct scientific ambition to ends that inspire us. And we can see no better way to achieve this civic aim than to venture deeper into space—to meet the unknown with a human face and return triumphantly to the human world.

2. Technology is also dangerous. It allows evil men to strike both secretly and decisively, with unimaginable power and no advance warning. And it allows small, vicious groups to terrorize large, civilized nations. It was not too long ago when overwhelming force required amassing great armies and when killing one's foes required meeting them face to face. Today it does not. Living a mere 62 years into the atomic era, we can only wonder whether a human future without a devastating clash of terrible weapons is even conceivable, and we can only hope that a bold and competent foreign policy can avoid a nuclear September 11. One feels, in

this war against terror, as though we are in a race against time—racing to democratize and moderate brutal and bitter regions of the world, before existing weapons technologies proliferate more widely or new weapons technologies make mass destruction more routine. In such a world, we cannot seek peace by unilateral disarmament or wish away the burdens of technological power, nor can we achieve peace by technological power alone. We should commit ourselves to the goal—perhaps tragically unattainable, at least in the world as we know it—of a post-nuclear weapons era. In the meantime, we should build up the intelligence systems, precision weapons, and troop strength that allow us to kill our enemies precisely before they attack us indiscriminately. Even as we do so, we must accept in advance that there are certain actions that might make us safer—such as bombing whole cities or brutally torturing captives—that we should never engage in. And we must prepare for the possibility that at “the crossroads of radicalism and technology,” as President Bush once put it, lies an inevitably tragic ending, even as we pursue a post-September 11 foreign policy aimed at “never again.”

3. We must also seek technologies that transform the balance of power in the world, especially the balance of energy power. We should be under no illusions that “energy independence” is ever possible, despite the fact that nearly every president and presidential candidate for the past three decades has promised to liberate us from “foreign oil.” But we can seek policies that intelligently promote new ways to meet our growing energy demand without relying so heavily on Middle Eastern supplies or environmentally hazardous fuels. This requires avoiding both the energy utopianism of the left and the energy parochialism of the right. Many good things—such as the well-being of American families and the capacity to meet our responsibilities in the world—depend on the flourishing of our energy-driven economy. For now, this means securing access to oil, which is a legitimate and necessary foreign policy goal. But many good things—such as the beauty of nature—are imperiled by an approach to energy that is blind to waste and devoid of reverence. What we need is a prudent moderation, aided wherever possible by scientific ingenuity and technological breakthroughs.

4. The pursuit of technological progress fulfills certain universal human desires—for health and longevity, convenience and control, pleasure and diversion. This is why one can barely imagine a free society today that is not also a technological society, though one can imagine a technologically advanced society (like China) that is not truly free. In America,

our technological success allows basic human dignity to flourish; it allows individuals and families to support themselves without degrading themselves, and to live with the freedom that allows us to pursue higher things, such as devotion to God or service to neighbors. But seen as an end in itself, technology can also threaten human dignity. It risks turning the weakest among us into usable resources, as with embryo research or experimentation on vulnerable human subjects. And it risks filling our lives with virtual reality at the expense of genuine human experience, as with the cultish addiction to video games and reality TV.

5. Technological societies also face novel burdens that are inseparable from their novel achievements. Modern medicine extends life and promotes geographic mobility. But it also means that a growing proportion of the elderly will suffer many years of long-term dementia and dependence, and thus stand in much greater need of care-giving children who live far away. Many people will end their lives sad, decrepit, and alone. In a similar vein, birth control allows us to have fewer children and greater sexual freedom. But the demographic collapse of Europe means that an entire civilization may be slowly dying of “presentism”—vanishing at the hands of a middle-aged generation dedicated to seeking its own well-being rather than passing down its cultural heritage to future generations. Perhaps technological life is so good that the adults want it all for themselves; they do not wish to share it with dependent children. Or perhaps, at bottom, the adults have so little faith in the cosmic significance of modern technological life that they feel little urgency to perpetuate it. Whatever the explanation, it is strange that the most prosperous parts of the world—with the possible exception of America’s religious and immigrant communities—have the least interest in procreation.

6. There is a large industry of people who seek scientific authority to bolster their deepest values: for example, by showing that religion is good for your health, or that abortion causes breast cancer, or that children who grow up in gay households are “well-adjusted.” Of course, these studies must all be judged on a case-by-case basis, according to the methodology that is used and the evidence that is presented. But as a general matter, we are skeptical that scientific studies will settle the hard ethical questions faced by individuals and communities. One issue that has especially enraged “pro-science” critics of the Bush administration is the promotion of “abstinence education” instead of “comprehensive sexual education.” These critics claim that teaching abstinence is “unscientific,” because the best studies show that talking about safe sex and handing out condoms are

more effective ways to reduce the incidence of sexually transmitted disease among teenagers. Let us assume, for now, that this is true. But what if it is also true that abstinence education, in certain communities, increases abstinence more effectively? Perhaps one can make an ethical argument for either approach to sexual education. But one cannot claim that giving out condoms is “more scientific” than teaching abstinence. The decision is finally a decision about values—a decision about what parents and communities seek to teach their children: safety or self-restraint, liberation or fidelity, self-regarding hedonism or self-giving love.

7. As the war on terror daily reminds us, the defense and promotion of technological society requires a depth of human courage—including the willingness to confront violent death in the name of freedom—that scientific progress cannot produce. In no small measure, the American project today is to defeat those who seek to unravel modernity using the destructive power of modern weapons, and to help those who seek to enter modernity do so without abandoning their own religious traditions. No doubt, our foes will be seduced as much, if not more, by the decadence of modern life as by the dignity of modern freedom. But for the American project to be a moral success, it must offer an image of the dignified technological society, as well as a reservoir of human virtue that technology does not provide. We must have the will to win, and we must deserve victory. In this great task, scientific progress is both necessary and limited: It is the necessary alternative to anti-modern despair, and it is limited because human excellence and human love have never required it to flourish. Virtue preceded modernity, and it will hopefully outlast it.

In the end, those seeking to confront the dilemmas of the moment, whether conservatives or liberals, can look backward and forward for inspiration: backward for examples of excellence and holiness, forward toward a potential age of liberal peace and prosperity, underwritten by modern technology. But as future-loving Americans, we should never succumb to an optimism about Progress that forgets how crooked the human timber will always be, or an ideology of Progress that puts more faith in our cleverness than in our virtue.

—Eric Cohen, *for the Editors*